

type antitoxin. In the case of *Bacillus botulinus* one is dealing with a group of bacteria, the members of which are capable of producing the same symptoms, and which have similar cultural characteristics, but which are different in their immunological reactions. Experimentally botulinus toxin is many times more potent than either of the analogous toxins. The symptoms of botulism appear after a period of incubation, but this period is a matter of minutes as compared to hours in the case of tetanus and diphtheria. Neither tetanus nor diphtheria toxin is poisonous when taken by mouth, whereas botulinus toxin is toxic when taken by mouth in very small doses. The toxins of the first two bacteria are destroyed by the digestive processes which go on in the stomach and duodenum. The botulinus toxin, however, resists the acidity of the stomach for many hours, and, furthermore, trypsin and pepsin have no destructive effect upon it. In view of the experiments carried on by the authors one must conclude that the placing of crude filtrate in the stomach consists essentially in an acidification *in vivo* with a resulting increase in potency similar to that which can be accomplished by acidification in a test-tube. The failure of the digestive processes to alter the toxin enables direct absorption to occur through the digestive tract. Besides differing from other bacterial toxins in that it is toxic by mouth, botulinus toxin differs from them in its reaction with ethyl alcohol. Precipitation of tetanus and diphtheria toxin with alcohol produces a very refined substance, while the botulinus toxin by precipitating it with alcohol is destroyed. In several recent outbreaks of food poisoning some of those exposed escaped altogether or had very mild symptoms. The investigators of the outbreaks discovered that those who had escaped symptoms had partaken rather freely of alcoholic beverages during the meal.

Pituitary Extract Intranasally in Diabetes Insipidus.—BLUMGART (*Arch. Int. Med.* 1922, 29, 509) describes a method of administering pituitary extract by intranasal spray, thus avoiding the necessity for frequent hypodermic injections in cases requiring continued treatment. Extract of the posterior lobe of the pituitary sprayed intranasally in a case of diabetes insipidus was found to check the polyuria and polydipsia as effectually as did hypodermic injection. Administration by mouth or rectum proved quite ineffectual. Given by mouth in tablets coated with phenylsalicylate the extract was likewise without effect. Histamin failed to modify thirst or polyuria, no matter how given. The exact mechanism of absorption is undetermined. It is pointed out, however, that there is an almost direct communication between the lymphatics of the nasal mucosa and the subarachnoid space.

Hypophysectomy in Dogs and Cats.—CAMUS and ROUSSY (*Compt. rend. Soc. de biol.*, 1922, 86, 1008) describe the technic of the buccal route and of the temporal route used by them in approaching the hypophysis. The operative mortality was high from meningitis, hemorrhage or brain injuries. Some of the animals died within several days, others within several weeks and still others lived for several months. Sixteen animals were sacrificed after a long time and ten or more were still living and apparently well. Total removal of the hypophysis was attempted at

each operation and this was controlled by thorough examination of the material removed at operation and by careful macroscopic and microscopic study of the base of the brain in the animals that died or were sacrificed for study. From their researches they conclude that for adult dogs and cats the hypophysis is not necessary for the maintenance of life.

Emetic Action of Digitalis.—HATCHER and WEISS (*Arch. Int. Med.*, 1922, 29, 690) showed in their convincing experiments that emesis resulted after the intravenous administration of a digitalis body when the carotid and vertebral arteries were tied, although very little of the poison could have reached the vomiting center. On the other hand perfusion of brain and medulla with defibrinated blood to which euabain had been added did not produce nausea or vomiting, nor was direct application of digitalis bodies to the vomiting center followed by emesis. The application of 0.0001 mg. apomorphin hydrochlorid to the vomiting center, however, was promptly followed by vomiting. Further experiments showed that when the nerve supply of the heart is intact emesis can be produced by the intramuscular injection of a digitalis body, but that these bodies are not capable of inducing vomiting when all of the nervous connections between the heart and the medulla are cut. These results are interpreted as evidence that the digitalis bodies produce emesis by a reflex, protective in nature, from the direct action of the drug on the heart itself. Impulses appear to pass from the heart to the medulla chiefly by way of the sympathetic but to some extent by way of the vagus. Such a conception of the mechanism of the emetic action of digitalis bodies obviously means that the effect of the drug on the heart cannot be dissociated from its emetic effect.

Divided Meals for Severe Diabetics.—GRAY. **Multiple Meals in Severe Diabetes.**—MURAYAMA (*Boston Med. and Surg. Jour.*, 1922, 186, 23). These authors present cases which show that in some instances at least the use of six or more meals a day instead of three is followed by an increase in the sugar tolerance for severe cases of diabetes. Absolute proof of cause and effect is neither given nor contended, but it is very strongly suggested that the severe diabetic's ability to metabolize food may be stimulated by small meals, frequently given. Gray speculates as to the cause of these apparently gratifying results. His theory of divided meals appears to be activation of the liver or pancreas by a small preliminary meal of carbohydrate given one or two hours before each main meal; the organism, being then in action at the time of that regular meal, responds to the food load more vigorously than with the every-day three-meal schedule. Relevant statements found in a search of the literature are briefly reviewed. The method which is outlined as follows is advocated as having practical value: (1) Intervals between meals, two and one-half hours, never less, except that the first activating meal (the keystone of this technic) may be taken any time between one and two and one-half hours before the regular breakfast; (2) caloric value of meals—of the extras the first must be the smallest meal of the day. Of the main meals the regular breakfast is to be the smallest; (3) composition of the activating meals: practically pure carbohydrate, generally most conveniently administered, as an orange, a grapefruit or 5 per cent vegetables.